Deployment of Emerging Technologies

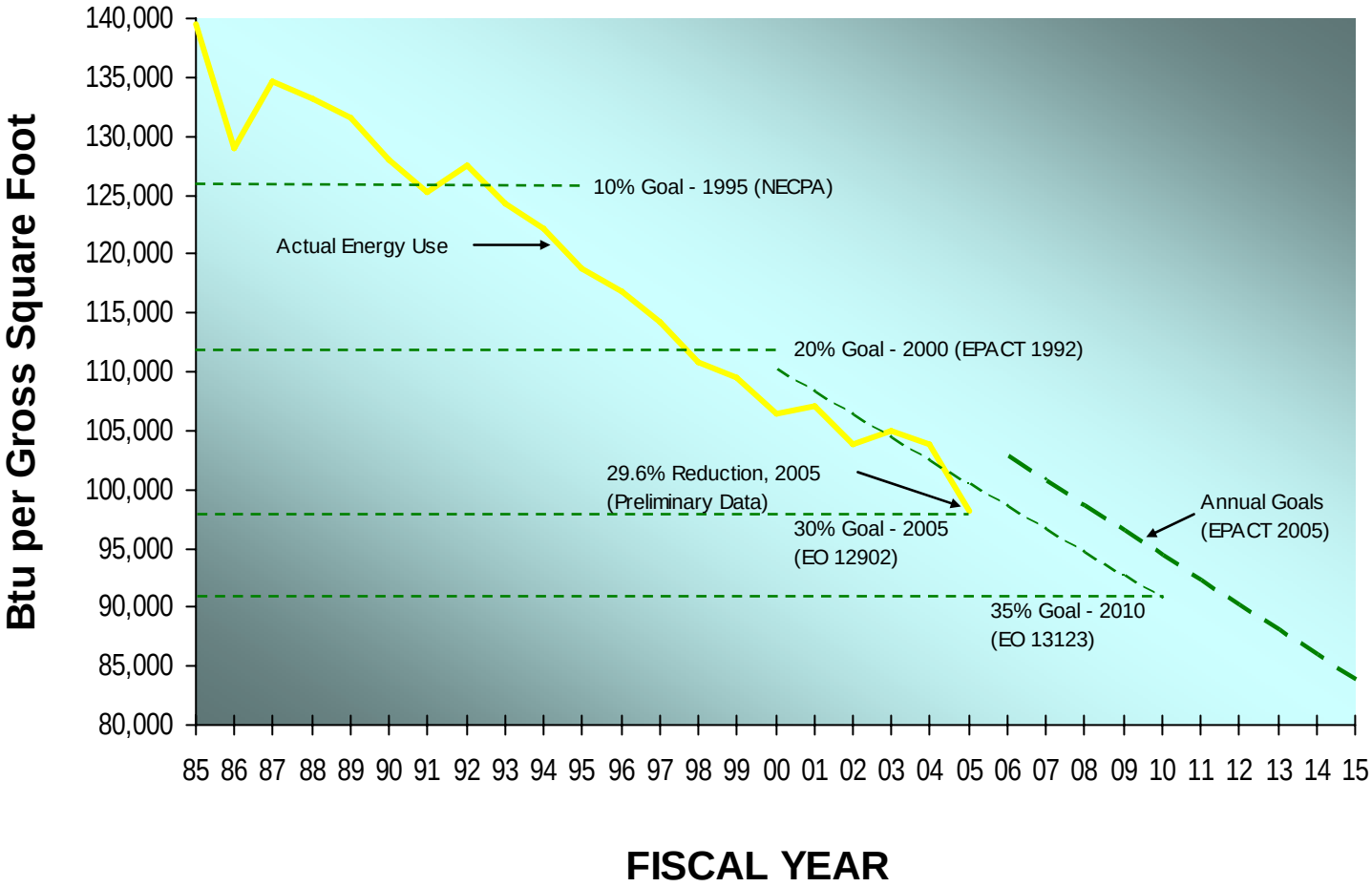
FUPWG

November 1, 2006

Brad Gustafson
Department of Energy

Progress To Date: Federal Standard Buildings

Although the Federal Government narrowly missed the 2005 goal, it is on track to meet the 2010 goal



Tech Transfer Mission

- To identify promising emerging technologies and accelerate deployment in Federal sector
  - Meet the Federal Energy Goals
  - Lead by Example
  - Enhance FEMP support of other agencies

Tech Transfer Initiative Focus

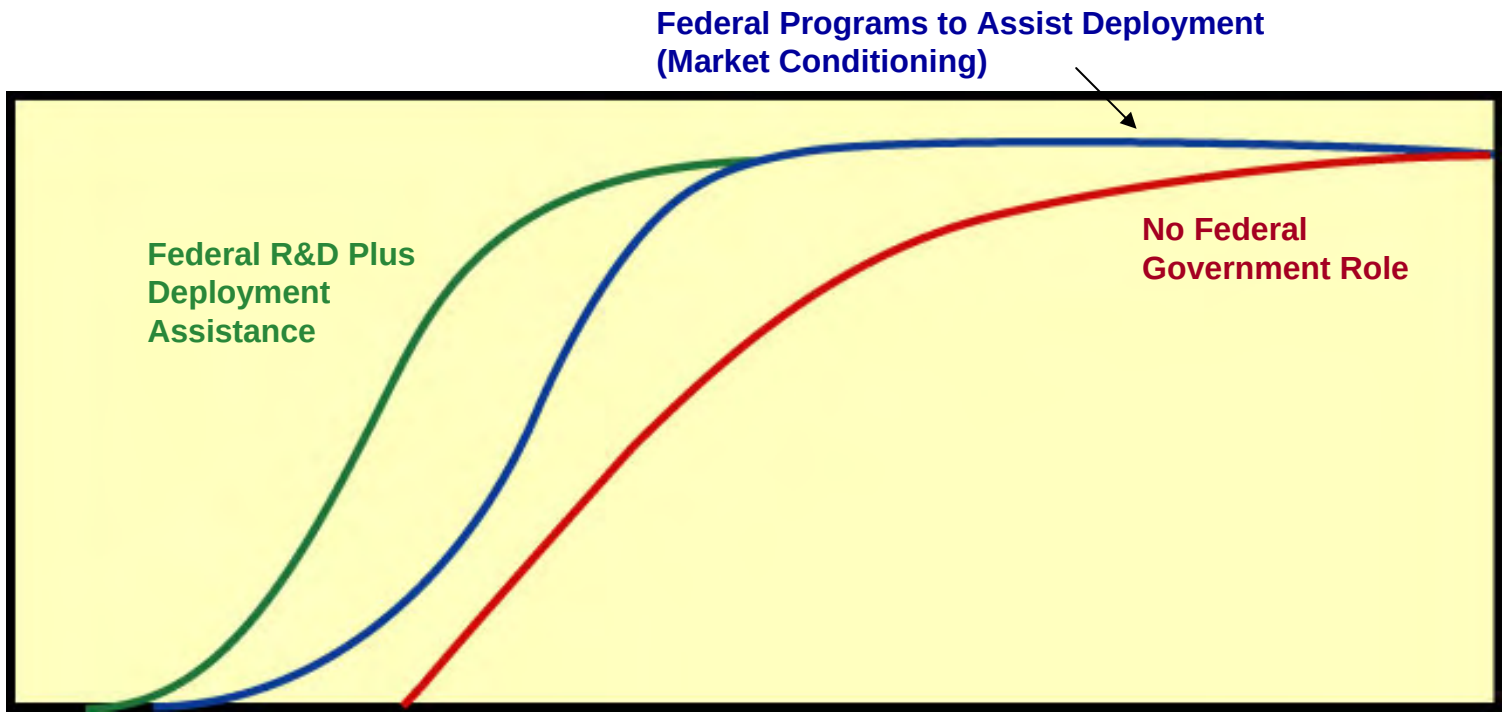
- Highly energy efficient products for residential and commercial buildings
- Technologies with potential for large energy savings on a national scale (Lack of market penetration in the Federal sector)
- Products requiring late-stage (two years or less) development prior to commercialization; AND
- Products commercialized, yet not established in the market

Technology Evaluation Criteria

- Cost Effectiveness
- Probability of Success
  - Market Readiness
  - Technical Feasibility
  - Reliability
  - Maintenance
- Impact on Federal Energy Utilization Index

U.S. Department of Energy
Energy Efficiency and Renewable Energy

Impact of Federal Role in Product Market Penetration



Public & Private Sector
Private Sector
Public Sector

Possible FEMP Actions to Accelerate Market Penetration

- Technology Testing and Validation
- Demonstrations
- Design Assistance
- Information, Training and Outreach
- Bulk Procurements and Federal Schedules
- Alternative Financing Support (Market Conditioning)

Ongoing Projects

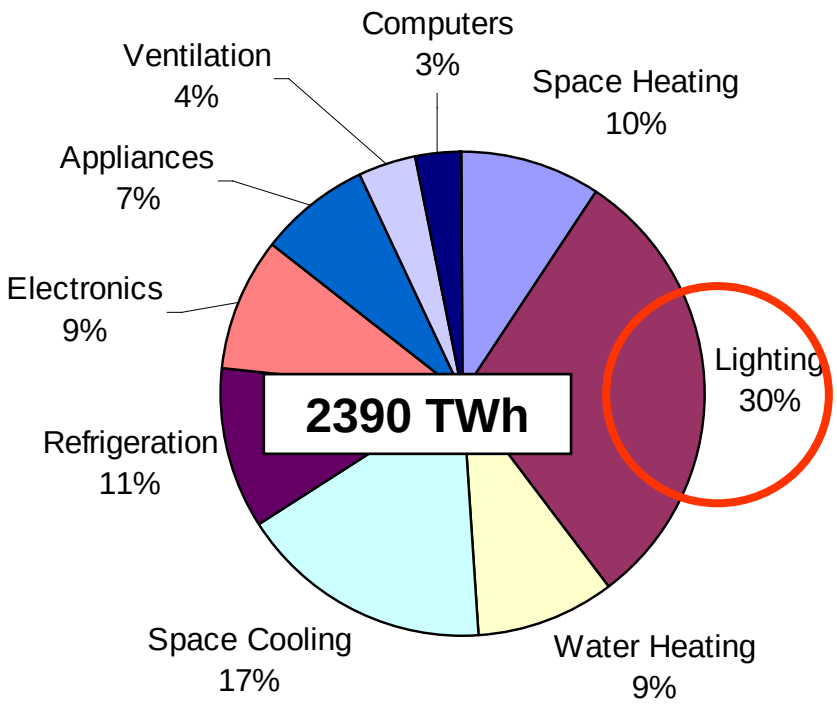
- Spectrally Enhanced Lighting (SEL)
- Wireless sensor HVAC control
- Intelligent Lighting
- Advanced (Electrochromic) Windows
- Hybrid Solar Lighting
- Advanced Lighting Efficiency/Demand Response Demonstration
- Variable Speed HVAC

U.S. Department of Energy
Energy Efficiency and Renewable Energy

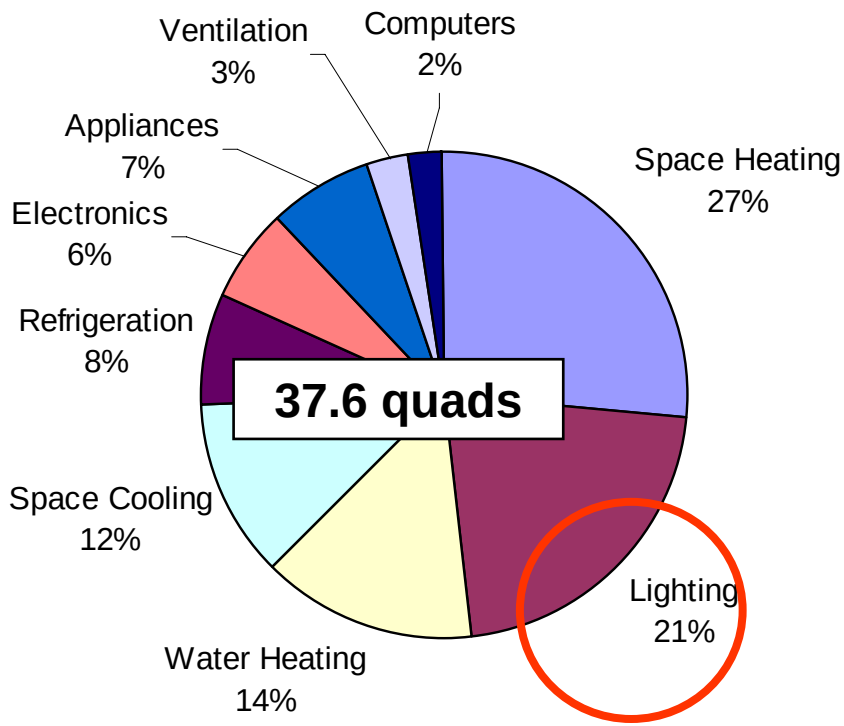
U.S. Buildings Energy End-Use Breakdown, 2001

Why The Focus on Lighting?

Site Electricity Consumption



Total Primary Energy (all fuels)



Source: Building Technology Program Core Databook, August 2003. http://buildingsdatabook.eren.doe.gov/frame.asp?p=tableview.asp&TableID=509&t=xls

Technologies of Interest

Technologies
1. Scotopic Lighting
2. Super T-8 Lighting
3. Task Lighting
4. Intelligent lighting controls
5. High-performance rooftop air conditioner
6. Hybrid solar lighting
7. Solar wall air preheating system / Transpired Solar Collectors
8. Wireless HVAC Control Sensors
9. Solid State Lighting
10. Switchable Glazings
11. Building Automation / Demand Response
12. Fuel Cells
13. High Output T5 High Bay Lighting
14. Advanced Metering

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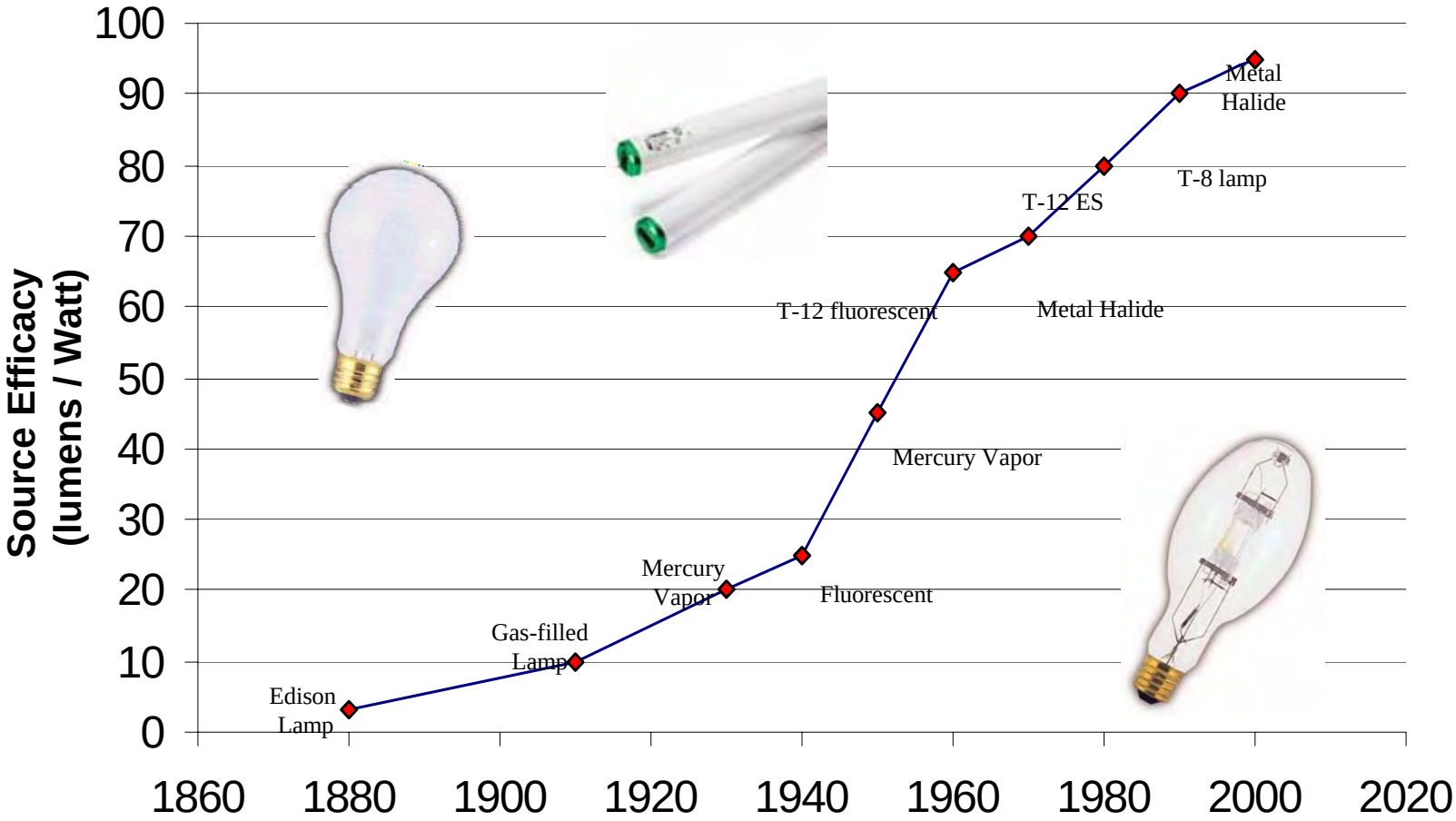
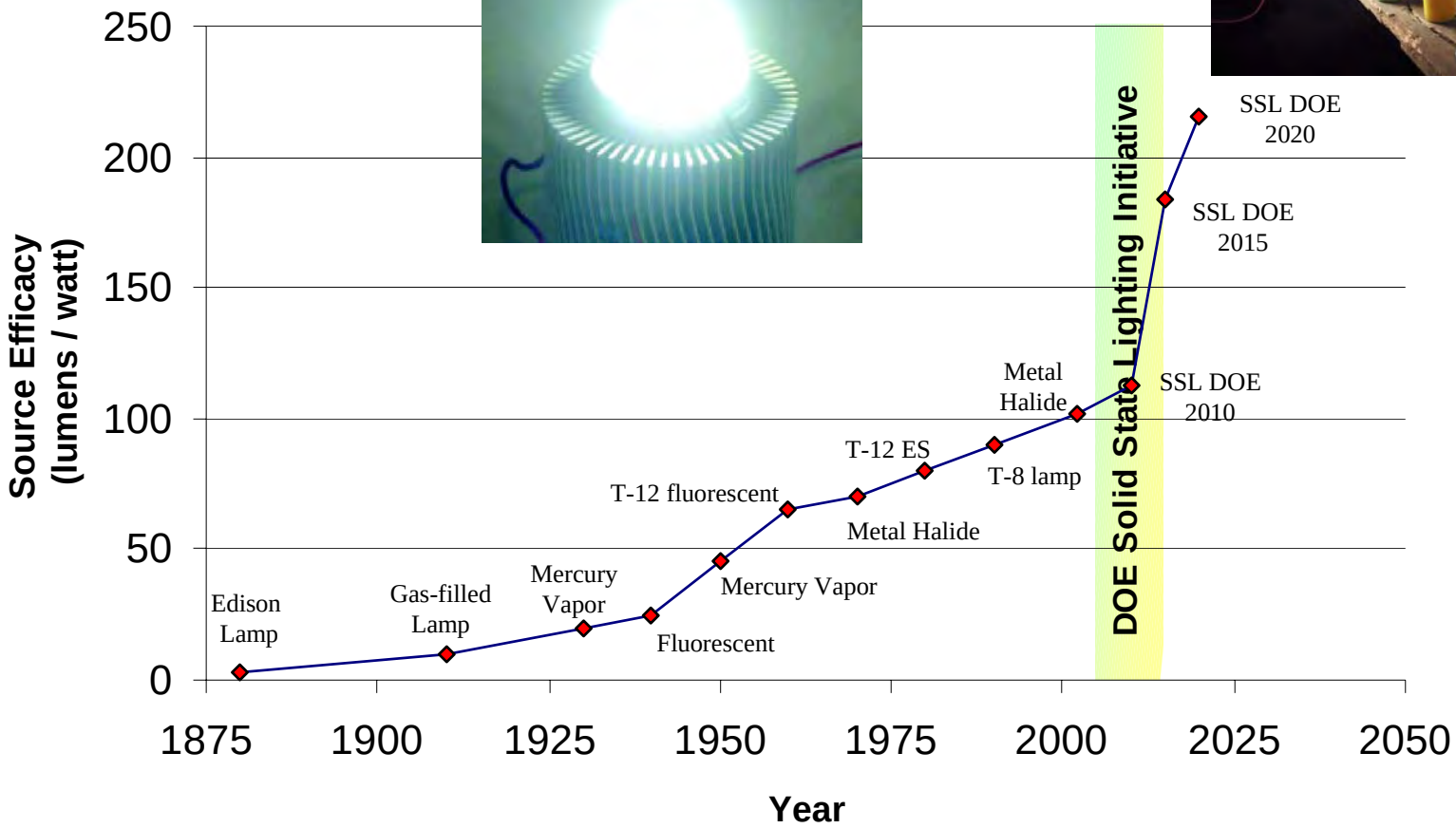
Historical Efficacy Improvement of White-Light Sources



Electric Lamp White Light Efficacy Improvement



Speakers and Topics

- Ron Shaw (Corporate Account Manager – Pacific Gas and Electric Company)
- Peter Schwartz (Principle - Peter Schwartz & Associates)
- Brian Liebel (Principal - AfterImage + Space)
  - Scotopically Enhanced Lighting (SEL)